UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,953	01/16/2004	Kiyoshi Satoh	ASMJP.055DV1	8185

20995 7590 12/29/2004

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
HASSANZADEH, PARVIZ	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/759,953	SATOH ET AL.	
	Examiner	Art Unit	
	Parviz Hassanzadeh	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) *11-13 and 20-44* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 14-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of species 4 (Fig. 5) in the reply filed on 11/8/04 is acknowledged.

Claims 11-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species 1-3, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 11/8/04.

Pursuant to a phone interview with Mr. Adeel S. Akhtar on 12/17/04, it was also agreed to further withdraw claims 20-44 in order to further expedite the prosecution of the application by reducing the number of independent claims to a single independent claim 1 and including the special technical features of the remaining claims into dependent claims of claims 1.

Drawings

The drawings are objected to under 37 CFR 1.83(a) because they fail to show the detail of the remote plasma chamber as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the

appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

It is not clear as how plasma is generated within the remote plasma chamber particularly the arrangement and relation of the plasma generating device (electrode) with respect to the material of the chamber is not clear.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 and 14-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1, the limitation "chamber comprises an aluminum alloy" is vague. it is not clear if the chamber is made of aluminum alloy of if the chamber including a member such as a chamber supporting or enclosing part such as part 305 in Fig. 4 of Noble or part 502 in Fig. 18 of Maydan. It is suggested to specify that the remote plasma chamber is made (formed) of aluminum alloy in accordance with the specification. For the

purpose of the examination and in accord with the specification it has been interpreted as the remote plasma chamber (tube), in which a plasma is formed, is made of aluminum alloy.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 14, 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noble et al (US Patent No. 6,450,116 B1) in view of Collison et al (US Patent No. 6,203,657 B1) and Maydan et al (US Patent No. 6,109,206).

Noble et al teach a rapid thermal processing apparatus (Fig. 3A) for performing a deposition process and a treatment process on a substrate (*a chemical vapor deposition device*) comprising:

a process chamber 213 (*a deposition reaction chamber*);

a remote plasma discharge 300 (*a plasma discharge chamber that is provided remotely from the reaction chamber*); and

an inlet member 360 (*a piping that links the reaction chamber and the remote plasma discharge chamber*),

the apparatus includes as gas inlet 269 formed through sidewall 214 for injecting a process gas into chamber 213 to allow various processing steps to be carried out in the chamber 213, for example, a plasma gas may be nitrogen, wherein activated plasma species are capable of cleaning the reaction chamber contaminated with a previously coating step in the reaction chamber 213 (*wherein energy coupled to the remote plasma discharge chamber activates cleaning gas within the plasma discharge chamber, and the activated cleaning gas is brought into the inside of the reaction chamber through the piping and changes solid substances adhered to the inside of the reaction chamber as a consequence of film formation, to gaseous substances, thereby cleaning the inside of the reaction chamber*),

the piping 360 may be made of aluminum (*wherein internal surfaces of the piping comprises a metal not corroded by the activated cleaning gas species*) (column 6, line 51 through column 8, line 45, and column 11, lines 36-45).

Noble et al fail to teach the remote plasma chamber comprises an aluminum alloy.

Collison et al teach a plasma processing system (Fig. 2A-3) including a remote plasma chamber 202 comprising chamber wall 104 and a protective liner 118, wherein the chamber wall 104 is grounded, that is, it is made of a conductive material, and wherein a plasma including a fluorine containing species is generated within the remote chamber (column 8, lines 9-26 and column 9, lines 17-38).

Maydan et al teach a plasma processing apparatus including a processing chamber made of aluminum alloy (abstract) and a remote plasma source comprising a chamber 502 preferably made of aluminum and an applicator tube 508 made of an energy transmittive material such as sapphire (column 18, lines 50-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the remote plasma source as taught by Collison et al in the apparatus of Noble et al as an art recognized equivalent of a remote plasma source. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the aluminum alloy as taught by Maydan et al as a suitable material for making a plasma chamber such as the remote plasma chamber of Collison et al.

Further regarding claim 2: The particular type of gas used is a process limitation rather than an apparatus limitation, and the recitation of a particular type of gas does not limit an apparatus claim, see *In re Casey,* 152 USPQ 235; *In re Rishoi,* 94 USPQ 71; *In re Young,* 25 USPQ 69; *In re Dulberg,* 129 USPQ 348; *Ex parte Thibault,* 64 USPQ 666; and *Ex parte Masham,* 2 USPQ2d 1647. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on the inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

Further regarding the claims 14, 17-18: The piping member 360 as shown in Fig. 3A is straight between the remote plasma discharge chamber and the reaction chamber. The process gas entering into the reaction chamber 213 from the inlet 214 and passing over the substrate 100 in the reaction chamber and being exhausted via 253 as shown in Fig. 3A.

Further regarding the claim 19: The apparatus further including light pipe assembly 218 including lamps 219 disposed between *quartz* plates 247, 248 (column 7, line 59 through column 8, line 36).

Further regarding the claim 16: The apparatus further includes a magnetron which can generate between 1.5 and 6.0 kilowatts (1500 W – 6000 W)of energy (column 12, lines 4-14). Further it has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley,* 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.,* 15USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed dos not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham,* 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

Claims 3, 4, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noble et al (US Patent No. 6,450,116 B1) in view of Collison et al (US Patent No. 6,203,657 B1) and Maydan et al (US Patent No. 6,109,206) as applied to claim 1 above, and further in view of Iyer (US Patent No. 6,498,109 B2).

Noble et al in view of Collison et al and Maydan et al teach all limitations of the claims as discussed above except for the frequency of the power source being between 300 kHz to 500 kHz, or the piping comprises a fluorine-passivated metal.

Regarding claim 15:

Iyer teaches a plasma processing apparatus (Fig. 1) including a remote plasma discharge 12 coupled to a plasma energy source 28, wherein the plasma energy source may be a pair of oppositely placed electrodes, inductive coils, or microwaves energy in order to create reactive species. The power from the energy source 28 is typically in the range of 50 watts to 5 kW and the frequency can range between 10 kHz and 200 MHz (column 3, lines 24-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the plasma energy source as taught by Iyer in the apparatus of Noble et al in view of Collison et al and Maydan et al as an art recognized equivalent of creating reactive species.

Regarding claim 3, 4:

Iyer also teach carbon tetra fluoride (CF4) is used in etching silicon, silicon oxide or other material used in manufacturing integrated circuit (column 1, lines 54-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use CF4 as an etching gas in the apparatus of Noble et al in view of Collison et al and Maydan et al. The use of the fluorine-containing gas as etching gas would inherently cause the interior surface of the piping 360 which is made of aluminum become passivated with fluorine. The piping 360 is in contact with the plasma discharge and it heated by the plasma gas.

Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noble et al (US Patent No. 6,450,116 B1) in view of Collison et al (US Patent No. 6,203,657 B1) and Maydan et al (US Patent No. 6,109,206) as applied to claim 1 above, and further in view of Fujimura (US Patent No. 4,718,976).

Noble et al in view of Collison et al and Maydan et al teach all limitations of the claims as discussed above except for through-flow valve positioned between the remote plasma discharge chamber and the reaction chamber.

Fujimura teaches a plasma processing apparatus (Fig. 3A, 4) including a conductance regulating device (valve) including a conductance regulating plate 22 in the from of a disc having a circular opening 21 disposed between a remote plasma generating chamber 27 and a treating chamber 30. The introduction of gas may be regulated by using different diameter of opening 21, or by using a shutter mechanism. The gas conductance device may include a circular gas diffusion plate 25 which can be moved up and down to close and open the opening 21. the conductance regulating plate 22, gas diffusion plate 25, and barrier 32 may be made of material such as aluminum which is highly resistant to treating gas such as etching gas (column 3, line 19 through column 4, line 50). The valve is in contact with the plasma discharge and it heated by the plasma gas.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the gas regulating device as taught by Fujimura in the apparatus of Noble et al in view of Collison et al and Maydan et al in order to regulate the rate of introduction of activated gas into the treating chamber.

Claims 1, 2, 14, 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noble et al (US Patent No. 6,450,116 B1) in view of Steinhardt (US Patent No. 6,706,141 B1) and Maydan et al (US Patent No. 6,109,206).

Noble et al teach a rapid thermal processing apparatus (Fig. 3A) for performing a deposition process and a treatment process on a substrate (*a chemical vapor deposition device*) comprising:

a process chamber 213 (*a deposition reaction chamber*);

a remote plasma discharge 300 (*a plasma discharge chamber that is provided remotely from the reaction chamber*); and

an inlet member 360 (*a piping that links the reaction chamber and the remote plasma discharge chamber*),

the apparatus includes as gas inlet 269 formed through sidewall 214 for injecting a process gas into chamber 213 to allow various processing steps to be carried out in the chamber 213, for example, a plasma gas may be nitrogen, wherein activated plasma species are capable of cleaning the reaction chamber contaminated with a previously coating step in the reaction chamber 213 (*wherein energy coupled to the remote plasma discharge chamber activates cleaning gas within the plasma discharge chamber, and the activated cleaning gas is brought into the inside of the reaction chamber through the piping and changes solid substances adhered to the inside of the reaction chamber as a consequence of film formation, to gaseous substances, thereby cleaning the inside of the reaction chamber*),

the piping 360 may be made of aluminum (*wherein internal surfaces of the piping comprises a metal not corroded by the activated cleaning gas species*) (column 6, line 51 through column 8, line 45, and column 11, lines 36-45).

Noble et al fail to teach the remote plasma chamber comprises an aluminum alloy.

Steinhardt et al teach a plasma processing system (Fig. 1, 4) including a remote plasma chamber 5 (Fig. 4, column 2, lines 19-39) comprising a coaxial conductor 30 comprising an outer conductor 18 and inner conductor 19 which are manufactured from metal such as aluminum (Fig, 1, column 4, lines 56-63, column 6, lines 37-59).

Maydan et al teach a plasma processing apparatus including a processing chamber made of aluminum alloy (abstract) and a remote plasma source comprising a chamber 502 preferably made of aluminum and an applicator tube 508 made of an energy transmittive material such as sapphire (column 18, lines 50-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the remote plasma source as taught by Steinhardt et al in the apparatus of Noble et al as an art recognized equivalent of a remote plasma source. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the aluminum alloy as taught by Maydan et al as a suitable material for constructing the remote plasma chamber of Steinhardt et al.

Further regarding claim 2: The particular type of gas used is a process limitation rather than an apparatus limitation, and the recitation of a particular type of gas does not limit an apparatus claim, see *In re Casey,* 152 USPQ 235; *In re Rishoi,* 94 USPQ 71; *In re Young,* 25 USPQ 69; *In re Dulberg,* 129 USPQ 348; *Ex parte Thibault,* 64 USPQ 666; and *Ex parte Masham,* 2 USPQ2d 1647. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on the inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

Further regarding the claims 14, 17-18: The piping member 360 as shown in Fig. 3A is straight between the remote plasma discharge chamber and the reaction chamber. The process gas entering into the reaction chamber 213 from the inlet 214 and passing over the substrate 100 in the reaction chamber and being exhausted via 253 as shown in Fig. 3A.

Further regarding the claim 19: The apparatus further including light pipe assembly 218 including lamps 219 disposed between *quartz* plates 247, 248 (column 7, line 59 through column 8, line 36).

Further regarding the claim 16: The apparatus further includes a magnetron which can generate between 1.5 and 6.0 kilowatts (1500 W – 6000 W)of energy (column 12, lines 4-14). Further it has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley,* 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.,* 15USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed dos not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham,* 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

Claims 3, 4, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noble et al (US Patent No. 6,450,116 B1) in view of Steinhardt (US Patent No. 6,706,141 B1) and Maydan et al (US Patent No. 6,109,206) as applied to claim 1 above, and further in view of Iyer (US Patent No. 6,498,109 B2).

Noble et al in view of Steinhardt et al and Maydan et al teach all limitations of the claims as discussed above except for the frequency of the power source being between 300 kHz to 500 kHz, or the piping comprises a fluorine-passivated metal.

Regarding claim 15:

Iyer teaches a plasma processing apparatus (Fig. 1) including a remote plasma discharge 12 coupled to a plasma energy source 28, wherein the plasma energy source may be a pair of oppositely placed electrodes, inductive coils, or microwaves energy in order to create reactive species. The power from the energy source 28 is typically in the range of 50 watts to 5 kW and the frequency can range between 10 kHz and 200 MHz (column 3, lines 24-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the plasma energy source as taught by Iyer in the apparatus of Noble et al in view of Steinhardt et al and Maydan et al as an art recognized equivalent of creating reactive species.

Regarding claim 3, 4:

Iyer also teach carbon tetra fluoride (CF4) is used in etching silicon, silicon oxide or other material used in manufacturing integrated circuit (column 1, lines 54-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use CF4 as an etching gas in the apparatus of Noble et al in view of Steinhardt et al and Maydan et al. The use of the fluorine-containing gas as etching gas would inherently cause the interior surface of the piping 360 which is made of aluminum become passivated with fluorine. The piping 360 is in contact with the plasma discharge and it heated by the plasma gas.

Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noble et al (US Patent No. 6,450,116 B1) in view of Steinhardt (US Patent No. 6,706,141 B1) and Maydan et al (US Patent No. 6,109,206) as applied to claim 1 above, and further in view of Fujimura (US Patent No. 4,718,976).

Noble et al in view of Steinhardt et al and Maydan et al teach all limitations of the claims as discussed above except for through-flow valve positioned between the remote plasma discharge chamber and the reaction chamber.

Fujimura teaches a plasma processing apparatus (Fig. 3A, 4) including a conductance regulating device (valve) including a conductance regulating plate 22 in the from of a disc having a circular opening 21 disposed between a remote plasma generating chamber 27 and a treating chamber 30. The introduction of gas may be regulated by using different diameter of opening 21, or by using a shutter mechanism. The gas conductance device may include a circular gas diffusion plate 25 which can be moved up and down to close and open the opening 21. the conductance regulating plate 22, gas diffusion plate 25, and barrier 32 may be made of material such as aluminum which is highly resistant to treating gas such as etching gas (column 3, line 19 through column 4, line 50). The valve is in contact with the plasma discharge and it heated by the plasma gas.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the gas regulating device as taught by Fujimura in the apparatus of Noble et al in view of Steinhardt et al and Maydan et al in order to regulate the rate of introduction of activated gas into the treating chamber.

Response to Arguments

Applicant's arguments with respect to claims 1-10 and 14-19 have been considered but are moot in view of the new ground(s) of rejection.

The newly amend claim 1 recite a remote plasma chamber comprising an aluminum alloy rather than dielectric material which is typically used in microwave plasma tube source.

Examiner has presented prior art teach a microwave plasma source may be made of conductive material and a remotely generated inductive coupled plasma chamber made of typical material used for a processing chamber.

Further regarding the assertion that the Noble et al do not teach a CVD chamber, it is suggested to consider column 4, lines 6-21, column 6, lines 51-67, column 15, line 27-67. It is also noticed that the elected species 4, Fig. 5, is thermal CVD chamber coupled to a remote plasma source.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (571)272-1435. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571)272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

P. Hassanzadeh

Parviz Hassanzadeh
Primary Examiner
Art Unit 1763

December 27, 2004